

ABSTRACT OF THE DISCLOSURE

A data exchange system includes at least one transmitting agent, at least one receiving agent, and a plurality of data links each having a crossbar coupling respective transmitting agents and receiving agents. A stream of data packets including at least one Order Critical Flow of data packets having a critical order to be sent from the transmitting agent to the receiving agent is divided for transmission among the plurality of data links. Multiple Order Critical Flows between the transmitting agent and the receiving agent are possible and the packets within such Order Critical Flows can be intermixed for transmission (along with packets from other Non-Order Critical Flows). The packets are transmitted over the data links so that packets from the same Order Critical Flow are transmitted over the same data link (while packets from that Order Critical Flow are in the Transmit Link Queue) and the packets are sequentially numbered, based upon the time when the packet was first received (and not the link over which the packet was received) upon the beginning of receipt by the receiving agent and reassembled by the receiving agent into a stream of data packets in accordance with the numbering sequence, thus maintaining the order of all Order Critical Flows.